Patent claims

1. Ester-group-cleaving enzyme obtainable by culturing the microorganism Thermomonospora fusca in a suitable nutrient medium, optionally in the presence of an inducer.

2. Ester-group-cleaving enzyme according to claim 1, the microorganism being a Thermomonospora fusca strain that has been deposited with the Deutschen Sammlung für Mikroorganismen [German Collection of Microorganisms] under the number DSM 43793.

3. Ester-group-cleaving enzyme according to either of the preceding claims, the enzyme being isolated from the nutrient medium by obtaining an enzyme-containing culture supernatant from the nutrient medium, which supernatant may optionally be concentrated, and
purifying the enzyme by chromatography, especially by ion exchange chromatography and/or hydrophobic interaction chromatography.

4. Ester-group-cleaving enzyme according to any one of the preceding claims, the enzyme being characterised by the following parameters:

molecular weight: 27400 d (determined by SDS gel electrophoresis) or 28200 d (calculated on the basis of the amino acid sequence),

temperature optimum/range: 65°C (30-80°C),

temperature stability: 70°C/30 min.

pH optimum/range: 6-7 (4- >8),

isoelectric point: 6.4.

5. Ester-group-cleaving enzyme according to any one of the preceding claims, characterised by the following amino acid sequence:

ANPYERGPNP	TDALLEASSG	PFSVSEENVS	RLSASGFGGG
TIYYPREN	NTYGAVAISP	GYTGTEASIA	WLGERIASHG
FVVITIDTIT	TLDQPDSRAE	QLNAALNHMI	NRASSTVRSR
IDSSRLAVMG	HSMGGGGTLR	LASQRPDLKA	AIPLTPWHLN
KNWSSVTVPT	LIIGADLDTI	APVATHAKPF	YNSLPSSISK
AYLELDGATH	FAPNIPNKII	GKYSVAWLKR	FVDNDTRYTQ
FLCPGPRDGL	FGEVEEYRST	CPF	

or

mutations resulting from substitution, insertion or deletion of amino acids, which mutations yield isofunctional enzymes.

6. Synthetic peptide or protein having the amino acid sequence of the ester-group-cleaving enzyme according to claim 5 or a part of the sequence thereof.

7. Polyclonal antibody directed specifically against an ester-cleaving enzyme according to any one of claims 1 to 5 or against a synthetic peptide or protein according to claim 6.

8. Monoclonal antibody directed specifically against an ester-cleaving enzyme according to any one of claims 1 to 5 or against a synthetic peptide or protein according to claim 6.

9. Hybridoma cell that produces a monoclonal antibody according to claim 8.

10. Ester-group-cleaving composition that comprises an ester-group-cleaving enzyme according to any one of claims 1 to 5 and/or a synthetic peptide or protein according to claim 6 and optionally additional enzymes, stabilisers, suitable surface-active substances and/or suitable organic solvents.

11. Ester-group-cleaving composition according to claim 10, wherein the additional enzymes are hydrolases, especially esterases, proteases, cutinases, lipases, phospholipases and lysophospholipases.

12. Ester-group-cleaving composition according to claim 11, wherein the hydrolases originate from microorganisms selected from Pseudomonas sp., Rizomucor miehei, Candida cylindracea, Candida antartica, Aspergillus niger, Chromobacterium viscosum, Commamonas acidovorans, Rhizopus arrhizus and Rhizopus delamar.

13. Use of an ester-group-cleaving enzyme according to any one of claims 1 to 5 or of a synthetic peptide or protein according to claim 6 or of an ester-group-cleaving composition according to any one of claims 10 to 12 for the degradation of ester-group-containing low molecular weight and/or macromolecular synthetic or natural compounds.

14. Use according to claim 13, wherein the ester-group-containing macromolecular compounds are aliphatic, cycloaliphatic, aliphatic-aromatic, partially aromatic or aromatic polyesters or copolyesters, polyesteramides, polyestercarbonates or polyesterurethanes, the chain of which may be extended and which may be branched or crosslinked.

15. Use according to claim 14, wherein the ester-group-containing macromolecular compounds form copolymers, mixtures and blends, composites, laminates or adhesive bonds with other materials.